Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

ve
7
78

VOL. 10 NO. 10 MARCH 4, 1960

LIBRARY
RECORD
MAR 8 - 1960
U. S. DEPARTMENT OF AGRICULTURE

Cooperative
ECONOMIC INSECT REPORT

Issued by

PLANT PEST CONTROL DIVISION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

Reports and inquiries pertaining to this release should be mailed to:

Survey and Detection Operations
Plant Pest Control Division
Agricultural Research Service
United States Department of Agriculture
Washington 25, D. C.

Volume 10 March 4, 1960 Number 10

COOPERATIVE ECONOMIC INSECT REPORT

Highlights of Insect Conditions

PEA APHID infestations continue to increase in alfalfa in Yuma County, Arizona, and ALFALFA WEEVIL larvae averaged 2-3 per alfalfa terminal in Richmond County, North Carolina. (p. 131).

Outlook for BEET LEAFHOPPER in the Intermountain Region calls for light movement into crop areas. (p. 132).

CATTLE LICE are heavy and troublesome in areas of Oklahoma, New Mexico and Utah. (p. 134).

INSECT DETECTION: Juniper webworm collected at Daytona Beach, Volusia County, Florida, is a new State record. (p. 134).

CORRECTION (p. 136).

SUMMARY OF INSECT CONDITIONS IN THE UNITED STATES - 1959

Fruit Insects - (p. 137).

INSECTS not known to occur in the United States. (p. 151).

****

Now Available on Request

"Insects Not Known to Occur in the United States," Volume 9, 1959. This is the third volume in a series combining all foreign pest releases (numbers 73-105) that were issued in the CEIR during 1959.

Also Available

Insects Not Known to Occur in the United States, Vol. 7, 1957
Insects Not Known to Occur in the United States, Vol. 8, 1958
Survey Methods - 1958
Distribution Maps - 1959

Please order by specific title and year.

****

Reports in this issue are for the week ending February 26, unless otherwise indicated.

WEATHER BUREAU 30-DAY OUTLOOK

MARCH 1960

The Weather Bureau's 30-day outlook for March calls for continued wintry weather over much of the Nation with temperatures averaging below seasonal normals over all areas except the extreme northeast and southeast. Coldest weather is predicted for the western half of the country. Precipitation is expected to exceed normal over the entire southern half of the Nation and also in the Northeast, with more snow than usual for March. Subnormal amounts are predicted for the Pacific Northwest and Northern Plains. In unspecified areas near normal precipitation is indicated.

Weather forecast given here is based on the official 30-day "Resume and Outlook," published twice a month by the Weather Bureau. You can subscribe through Superintendent of Documents, Washington 25, D. C. Price $4.80 a year, $2.40 a half year.

WEATHER OF THE WEEK ENDING FEBRUARY 29

Winter ruled supreme over the Nation this week. Temperatures in all sections except the North Atlantic States, southern Florida, and the upper Great Lakes averaged below normal. Unusually severe and persistent cold extended from the Far Western States and the Rocky Mountains to the Southeast. Arctic air swept southward over the Great Plains, the Mississippi Valley, and the Southeastern States, bringing freezing temperatures as far south as the lower Rio Grande Valley in Texas and in northern Florida, and below zero to the High Plains of Texas, where -13° was recorded at Muleshoe. In the central and northern Great Plains minimum temperatures were generally well below zero on most days and maximum temperatures above freezing were rare from Kansas northward throughout the week. Temperatures averaged more than 15° below normal from the Dakotas, Montana, and Utah to southern Texas and Arkansas, and more than 25° below normal over eastern Colorado and Wyoming, and western Kansas, Nebraska, and South Dakota.

Precipitation was very light along the usually rainy northern Pacific coast, and in other sections west of the Rocky Mountains only light to moderate snowfall was reported. Scattered light snow flurries extended from the northern Rockies to the upper Great Lakes. Low pressure systems, developed over the southern Rocky Mountain and Plateau States and in the western Gulf of Mexico, moved eastward and northeastward during the week, providing widespread precipitation in the south and eastern quarters of the Nation. Moderate to heavy snow extended from eastern Colorado and New Mexico and central Arkansas to the lower Great Lakes, the Tennessee and Ohio Valleys, and New York and New England. Up to 16 inches of snow were recorded in Kansas, 6 to 8 inches in Oklahoma, 5 to 12 inches in Arkansas, and 4 to 8 inches in Illinois, Kentucky, Pennsylvania, and Ohio.

Moderate to heavy rain fell over central Florida and along the coast from the Carolinas to southern New England. Snow changed to rain from New Jersey northeastward during the passage of a storm center to the west on Thursday and Friday. (Summary supplied by U. S. Weather Bureau.)

CEREAL AND FORAGE INSECTS

GREENBUG (Toxoptera graminum) - OKLAHOMA - Light numbers common in clumps of volunteer small grain plants throughout northeastern area. However, none were noted in fields of fall-seeded grain in this area. (VanCleave). Populations continued low in fields of wheat checked in the Hennessey area of Kingfisher County, averaging 0, 8 and 10 per linear foot in 3 fields. (Owens). Counts ranged 1-4 per linear foot in a field of wheat checked in Washita County, with none noted in 4 other fields checked in Washita and Beckham Counties (Hudson), nor in 2 fields of wheat in Tillman County (Hatfield). Counts ranged 25-50 per linear foot in a field of small grain checked south of Ada, Pontotoc County (Young), and ranged 4-60 per linear foot (averaged 25 per linear foot) in 4 fields of small grain checked in Marshall and Love Counties, with none noted in another field in Love County (Vinson). Counts averaged 0, 1 and 10 per linear foot and 32 per square foot in 4 fields checked in Choctaw County; heaviest counts were noted in field of volunteer plants. (Goin).

APPLE GRAIN APHID (Rhopalosiphum fitchii) - OKLAHOMA - None noted in fields of small grain checked in northeastern area. (VanCleave). Counts averaged 0, 3 and 3 per linear foot in 3 fields of wheat checked in the Hennessey area of Kingfisher County (Owens) and none were noted in 2 fields of wheat checked in Tillman County (Hatfield). Counts averaged 0.5, 6 and 10 per linear foot in 3 fields checked in Marshall and Love Counties, with none being noted in 2 other fields in the same area. (Vinson).

CORN LEAF APHID (Rhopalosiphum maidis) - OKLAHOMA - Averaged 4, 15 and 35 per linear foot in 3 fields of small grain surveyed in Marshall and Love Counties, none being noted in 2 other fields in the same area. (Vinson). ARIZONA - Light infestations present in barley in the central portion of the State. (Ariz. Coop. Sur.).

Small Grain Insects in Arkansas - A limited survey in the eastern portion of Arkansas showed most fields of small grain to be free of GREENBUG (Toxoptera graminum). Although present in a few fields, this pest averaged less than one per linear foot. Only an occasional APPLE GRAIN APHID (Rhopalosiphum fitchii) was found. (Ark. Ins. Sur.).

SPOTTED ALFALFA APHID (Therioaphis maculata) - OKLAHOMA - Found in only one of 3 alfalfa fields surveyed in the Kingfisher-Garfield County area, averaging 15 per square foot of crown area in the infested field. (Owens). Counts averaged 8 per square foot in a field of alfalfa checked in Marshall County (Owens) and 0, 0.2, 1.0 and 8 per square foot in 4 fields of alfalfa surveyed in Choctaw County (Goin). TEXAS - Light, spotted infestation on alfalfa in the Brazos River bottoms. (Randolph). ARIZONA - Infestations are very light in alfalfa, statewide. (Ariz. Coop. Sur.). NEW MEXICO - Cold, damp weather appears to have slowed down buildup in alfalfa fields in southern counties. (N. M. Coop. Rpt.).

PEA APHID (Macrosiphum pisi) - OKLAHOMA - Counts averaged 0, 0.5 and 5 per square foot of crown area in 3 fields of alfalfa checked in the Kingfisher-Garfield County area. (Owens). Counts per square foot in alfalfa averaged 0.5 in a field checked in Marshall County (Vinson) and 2, 8, 25 and 32 in 4 fields surveyed in Choctaw County (Goin). ARIZONA - Infestations continue to increase in Yuma County alfalfa, with medium populations present. Infestations are light in other areas. (Ariz. Coop. Sur.). ARKANSAS - None found. (Ark. Ins. Sur.).

ALFALFA WEEVIL (Hypera postica) - NORTH CAROLINA - Larvae averaged 2-3 per terminal on alfalfa in Richmond County. Some larvae about half grown. (Jones, Campbell).

FRUIT INSECTS

SCALE INSECTS - MARYLAND - Eggs of *Chionaspis furfura* observed on apple at Baltimore, February 19. (U. Md., Ent. Dept.). CALIFORNIA - Heavy infestations of *Aonidiella aurantii* present on lemon trees and other citrus, along with *A. citrina*, in Sacramento, Sacramento County, and *A. aurantii* light on citrus and grapefruit in San Luis Obispo, San Luis Obispo County. *Coccus hesperidum* present in a medium infestation on citrus in Nipomo, San Luis Obispo County. (Cal. Coop. Rpt.).

MEXICAN FRUIT FLY (*Anastrepha ludens*) - MEXICO - Trapping in Tijuana, Tecate, Ensenada and Mexicali, Baja California, and San Luis, R. C., Sonora, was negative. In Tijuana, inspections of fallen fruit on 8 properties were also negative. (PPC, Mex. Reg., Jan. Rpt.). ARIZONA - Trapping in Nogales and Yuma areas was negative. CALIFORNIA - Trapping for adults and fruit cutting for larvae were negative in San Diego County, and trapping in Imperial County was also negative. (PPC, West. Reg., Jan. Rpt.).

TRUCK CROP INSECTS

STRAWBERRY APHID (*Pentatrichopus fragaefolii*) - CALIFORNIA - Heavy populations of this species and of a leaf roller (*Clepsis peritana*) present on strawberry in El Cajon, San Diego County. (Cal. Coop. Rpt.).

GREEN PEACH APHID (*Myzus persicae*) - CALIFORNIA - Light on sugar beet plantings in the Yolo-Woodland areas of Yolo County. (V. Strombler).

Beet Leafhopper Conditions in the Southern Desert Areas of Southern Utah and Nevada, Southeastern California, and Central Arizona - 1960

The beet leafhopper spring movement from the southern desert breeding areas to the cultivated districts of central Arizona and southwestern California is expected to be light; the movement to central and southern Utah and southern Nevada is expected to be light; and the movement to northern Utah and western Colorado is expected to be light. It should be emphasized, however, that this report concerns *only* the beet leafhopper populations present in the far southern desert breeding areas, and does not have reference to populations that may be in local breeding areas in northern and eastern Utah.

Time of Movement: It is to be understood that this statement is based on present conditions. Movement of the leafhopper into cultivated areas of central and southern Arizona and southeastern California is expected to start by late February to early March, movement to cultivated areas of southern Nevada and Utah is expected to start by late March to early April, and movement to central Utah and western Colorado is expected to start by late April. Weather conditions during the next two months will have a bearing on the amount of the leafhopper population that moves from the desert areas to cultivated districts.

Southern Desert Breeding Ground Conditions: Beet leafhopper movement is expected to be light this year. Plant cover at present is favorable for leafhopper buildup in the southern desert but leafhopper populations are low over most of this area, possibly due to prolonged drought conditions in the fall which may have caused considerable mortality among the overwintering leafhopper population before the annual desert host plants were germinated by rains occurring the first part of November and during December. Host plants were found at 113 of the 211 stops made, or in about 53% of the 50,000-square-mile area represented in the survey. In the 26,500-square-mile area where host plants were present at the time of the February survey, the population averaged 0.014 leafhopper per square foot this season, in comparison with 0.05 leafhopper per square foot where 5,000 square miles had host plants in 1959, and with 0.66 leafhopper per square foot where 35,000 square miles had host plants in 1958. It will be necessary to check the southern desert area later in the season in order to determine possible leafhopper movement from desert areas in northern Mexico across the borders of Arizona and California. However, during the February survey this season the beet leafhopper populations averaged 0.17 per square foot north of the 34 degree parallel and 0.11 per square foot in the portion of the area south of this line, at the stops checked.

Viruliferous Content of the Beet Leafhoppers: Leafhoppers from representative stops in the area checked during the February survey have been caged on susceptible beet plants but test readings will not be available until a later date.

Summary: The estimated beet leafhopper population in the southern desert areas is about 8.6 billion in comparison with about 3.0 billion in 1959 and 5.3 billion in 1957, the latter two years in which light leafhopper movement occurred into cultivated areas of Utah and western Colorado, resulting in only light curly-top damage to susceptible crops.

Life History of Beet Leafhoppers: The beet leafhopper is more or less of a desert insect. Its preferred environment is one of annual succulent plants growing in an area of high temperatures and low humidities. All stages, except the adult females, usually die during the fall or early winter. In the far southern portion of the southern breeding grounds the first generation matures by late January or early February. The leafhoppers from the early broods shift to more succulent host plants in the breeding grounds or to the north where plants are not so far advanced as at the lower elevations. Two or three broods may develop with a movement after each has matured. (Blakemore, Dorst).

TOBACCO INSECTS

TOBACCO FLEA BEETLE (Epitrix hirtipennis) - GEORGIA - Light infestations present on tobacco plant beds in Worth, Tift, Irwin, Coffee, Bacon, Wayne and Tattnall Counties. (Johnson).

VEGETABLE WEEVIL (Listroderes costirostris obliquus) - GEORGIA - Light to moderate infestations present on tobacco plant beds in 7 tobacco-raising counties. (Johnson).

SPRINGTAILS - GEORGIA - Moderate infestation on tobacco plant beds in Bulloch County. (Johnson).

FOREST, ORNAMENTAL AND SHADE TREE INSECTS

SOUTHERN PINE BEETLE (Dendroctonus frontalis) - TEXAS - Control efforts still seriously hampered by inaccessibility due to wet ground in Hardin and Liberty Counties. Two small spot infestations were controlled but 31 known spot infestations are uncontrolled, 5 of these containing more than 100 brood trees. The large spot infestations are increasing. Scattered single brood trees found infested by checkers on the ground. (Young).

AN IPS BEETLE (Ips plastographus) - CALIFORNIA - Heavy on Monterey pines on the California Polytechnic campus in San Luis Obispo, San Luis Obispo County, and in Santa Barbara, Santa Barbara County. (Cal. Coop. Rpt.).

AN ARCTIID (Halisidota argentata) - CALIFORNIA - Heavy larval infestation occurred on pine in Menlo Park, San Mateo County. (Cal. Coop. Rpt.).

TEXAS LEAF-CUTTING ANT (Atta texana) - TEXAS - Reported to have defoliated loblolly pine seedlings in Harrison County. (Young).

JUNIPER WEBWORM (Dichomeris marginella) - FLORIDA - Collected on Irish juniper (Juniperus sp.) at Daytona Beach, Volusia County, January 27, 1960, by E. B. Smith and L. W. Holley. Det. H. W. Capps. The species is not represented in the National collection or in ARS records from Florida, nor does the State Plant Board of Florida have any previous record for the State. This is apparently the first record of this webworm from Florida. (Fla. Coop. Sur.).

TOBACCO BUDWORM (Heliothis virescens) - CALIFORNIA - Light infestations occurring on ornamentals in Santa Barbara, Santa Barbara County. (Cal. Coop. Rpt.).

ANGOUMOIS GRAIN MOTH (Sitotroga cerealella) - CALIFORNIA - Heavy adult populations occurred on ornamentals and weeds in Santa Barbara, Santa Barbara County. (Cal. Coop. Rpt.).

A PSYLLID (Psylla uncatoides) - CALIFORNIA - Heavy on albizzia and acacia in Belmont, San Mateo County. This psyllid is becoming more widespread and damaging within the State. (Cal. Coop. Rpt.).

A WAX SCALE (Ceroplastes sp.) - MARYLAND - Overwintering females of C. ceriferus (of Southeastern United States author) noted on Chinese holly at Hyattsville, Prince Georges County, February 17. (U. Md., Ent. Dept.).

SCALE INSECTS - TEXAS - Aspidiotus hederae causing damage to pyracantha plants in Eastland County (Texas Coop. Rpt.) and Fiorinia theae causing considerable damage to citrus trees and camelia plants in Orange County (Turney, McKenzie). CALIFORNIA - Heavy populations of A. hederae making privet unsightly in Sacramento, Sacramento County. (Cal. Coop. Rpt.).

SOUTHERN RED MITE (Oligonychus ilicis) - MARYLAND - Injury to leaves of American holly noted at Bel Air, Harford County. Eggs and cast skins present. (U. Md., Ent. Dept.).

INSECTS AFFECTING MAN AND ANIMALS

CATTLE GRUBS (Hypoderma spp.) - MARYLAND - H. lineatum averaged 3 larvae per animal in 6 infested dairy heifers of 23 animals examined in Howard County, February 19. (U. Md., Ent. Dept.). UTAH - Grubs ranged 2-30 per animal in unsprayed cattle in the Loa area, Wayne County, and 0-4 in cows. Untreated cattle in the Gunnison-Mayfield area ranged 1-19 grubs per young animal, with many still showing no grubs. (Knowlton).

CATTLE LICE - OKLAHOMA - Unspecified species heavy on 30 percent of 80 head of yearling steers checked at El Reno, Canadian County. (Kinzer). NEW MEXICO - Several cattle herds in Sierra and Grant Counties reported heavily infested. (N. M. Coop. Rpt.). UTAH - Troublesome to unsprayed cattle throughout Sanpete and Wayne Counties, often being severe in Wayne County. Also common throughout Emery County and parts of Davis and Sevier Counties. Severe infestations also reported on cattle in the Uintah Basin. (Knowlton).

SHEEP KED (Melophagus ovinus) - UTAH - Numerous in Sanpete County farm flocks. (Knowlton).

EAR TICK (Otobius megnini) - UTAH - Common and sometimes serious in cattle running on desert ranges in Wayne County. (Knowlton, Hall).

STORED-PRODUCT INSECTS

INDIAN-MEAL MOTH (*Plodia interpunctella*) - NEW MEXICO - Larvae and adults abundant in feed storerooms checked in Dona Ana, Hidalgo and Grant Counties. (N. M. Coop. Rpt.).

BENEFICIAL INSECTS

PARASITES AND PREDATORS - OKLAHOMA - Counts of hymenopterous parasites averaged 0.02, 2 and 2 per linear foot, respectively, in 3 fields of small grain checked in Marshall and Love Counties. (Vinson). No hymenopterous parasites were noted in other fields of small grain surveyed in the State and no predators were noted in the fields of alfalfa and small grain surveyed throughout the State. (VanCleave et al.). CALIFORNIA - A braconid (probably *Trioxys* sp.) and a lacewing (*Chrysopa* sp.) were present in association with heavy populations of strawberry aphid and a leaf roller on strawberry in El Cajon, San Diego County. (Cal. Coop. Rpt.).

MISCELLANEOUS INSECTS

A BEE MITE (*Acarapis dorsalis*) - UTAH - Examination of 772 honey bees (*Apis melifera*) from 22 colonies at Logan, Cache County, showed 152 bees (19.2 percent) with evidence of infestation in the scutal fissure. All stages of the mite were present, as well as large numbers of cast skins. Eighteen of the colonies showed infestation. Highest infestation in an individual colony was 15 infested bees of 43 examined. (Jaycox). This mite is noneconomic.

CLOVER MITE (*Bryobia praetiosa*) - NORTH CAROLINA - Invading a house in Catawba County. (Giles, Farrier). ARIZONA - Light to medium infestations in and around homes are a problem in several areas of the State. (Ariz. Coop. Sur.). UTAH - Entering some homes at Salt Lake City. (Knowlton).

STONEFLIES (*Allocapnia* spp.) - PENNSYLVANIA - Reported in CEIR 10(8):98 as *Allocapnia* sp., has now been determined by H. H. Ross as 2 species. The one reported from Warren County was determined as *A. recta*, and the one from Washington County as *A. vivipara*. (Pepper).

SPRINGTAILS - MASSACHUSETTS - Numerous inquiries received during past two weeks in Plymouth and Bristol Counties. (Tomlinson).

EASTERN SUBTERRANEAN TERMITE (*Reticulitermes flavipes*) - RHODE ISLAND - First alate forms of season observed in residence in Providence, February 24.(Mathewson).

TERMITES - MASSACHUSETTS - Unspecified species swarming in slab constructed house at Sagamore Beach, Barnstable County, February 11. (Tomlinson).

LIGHT TRAP COLLECTIONS

	Pseudaletia unipuncta	Feltia subterranea	Prodenia ornithogalli	Agrotis ipsilon
ARIZONA				
Mesa 2/15-21			5	
FLORIDA				
Homestead 2/16, 18		6	4	
LOUISIANA				
Baton Rouge 2/19-25				1
SOUTH CAROLINA				
Charleston 2/22-28	3	1	4	3
Clemson 2/20-26	1			
TEXAS				
Brownsville 2/8-19	8	3		12

CORRECTION

CEIR 10(3):30,31 - The number of European corn borer larvae per 100 plants in Iowa for 1959 should read 50 rather than 99 as indicated on the fourth line on page 30 and in the last column of the table on page 31.

SUMMARY OF INSECT CONDITIONS IN THE UNITED STATES [1]

1959

FRUIT INSECTS

Deciduous Fruit Insects: CODLING MOTH (Carpocapsa pomonella) activity during 1959 was variable, according to the area. Generally speaking, the greatest amount of damage occurred where climatic conditions were favorable and treatments were not adequate. Damage was severe in south central Kansas, even in some well-sprayed orchards, and losses were greater in 1959 than in 1958 in Maryland. In Vermont, an unusual outbreak of the second brood occurred because of the unseasonably warm weather in the summer and increases ranging from light to serious were reported throughout the Hudson Valley of New York. Population levels appeared to be lower than usual in Massachusetts, Connecticut and New Jersey and they were reported light in Delaware, Virginia and Georgia. Bait trap collections in Maine during mid-August were much higher than in previous years. Activity of the codling moth in the Central States was as follows: Good control was reported in Ohio, with a few orchards being severely damaged, and light populations were generally noted in Indiana. In Illinois, however, a rapid buildup was experienced in late August in which a heavy third brood appeared, indicating a high carryover in 1960. Wisconsin rated this species as one of the major apple pests of the season. Reports of "wormy" apples were widespread in this State. Less damage occurred in the northeast area of Kansas than for several years, although there was some buildup during the prolonged rainy period in September. Damage in some south central Kansas areas was severe.

Codling moth damaged apples and pears in the Stillwater area of Oklahoma during July and infestations affected the yield of these two fruits in Colorado; however, the major reduction of apples in Colorado was due to the light fruit set. Well-sprayed orchards in Utah were sometimes as high as 5 to 40 percent or more infested and poorly sprayed orchards were often 100 percent "wormy". In Wyoming, nearly all apples grown in the State were damaged, largely because most trees are not treated. "Wormy" apples averaged 2 to 15 percent at packing sheds in northern New Mexico and most unattended and improperly treated orchards had from 50 to 98 percent infested fruit.

Codling moth populations remained at normal levels in Nevada and populations were lower than normal in Washington. Samples from 8 orchards in the Yakima area showed fruit injury about one-twentieth and "wormy" fruit about one-fiftieth of that which occurred in the excessive damage year of 1958.

Other pertinent data that were reported on codling moth are as follows: Maine - Recoveries from trunk bands in June showed light numbers overwintered in a test orchard. Mortality due to disease and predation was low. Adult flight began about June 8 and continued through July. Low catches were recorded from most bait traps. Cage emergence at Highmoor Farm reached peak numbers from July 1 to 13. Delaware - Scarring first noted during first week of June but populations were very low. Adults from spring brood emerged in mid-July. Wisconsin - Pupation was observed in Door County on May 14 and adults emerged about June 6. Larval entries in Crawford County apples occurred earlier in June than expected. Entries were first noted in Door County apples on June 18. Emergence of second brood began in mid-July in Crawford County and adults were observed July 24 in Door County. A partial third brood was also observed in Door County. Kansas - Adults first emerged in south central area on May 7 and in the northeast on May 18. Illinois - A light carryover of the overwintering generation was recorded but the second generation showed up in larger numbers. A high carryover is expected in 1960. Oregon - First-tagged egg hatched May 27 in Jackson County and May 26 in Willamette Valley. The first adults of the season appeared in bait pots at Hood River on May 22. Initial emergence dates over the State were more uniform than in 1958. New Mexico - Overwintering larvae were very abundant during February and March in many Sandoval and Bernalillo County orchards.

---

[1] Including all reporting states except Hawaii and Alaska, which were carried in CEIR 10(4):46 and CEIR 10(6):74, respectively.

RED-BANDED LEAF ROLLER (Argyrotaenia velutinana) was an important pest in several areas. An unusual, late outbreak was recorded in Connecticut and this species was late and more numerous than in past years in Massachusetts. The species was an important fruit pest in Pennsylvania during 1959, and severe injury to late apples by the third-brood larvae was recorded in Delaware, but little injury from second brood was sustained. Numbers were normal in Maryland and New Jersey and were not a problem in Virginia. The second brood was much more abundant in the Hudson Valley of New York than in 1958 but probably no more than usual. The first brood decreased from average levels in Orange and other counties in New York and all broods decreased in Rockland County. An increase in the third brood was noted in Orange County, being favored by the long season and warm fall.

Red-banded leaf roller was generally light in Ohio except in the northeastern area where third-brood infestations were severe in several orchards, and a high carryover in some orchards in Illinois led to considerable damage by the first generation. The later generations caused little damage in Illinois, although some damage was showing up at harvest. In Kansas, the species was a problem in the northeast area and continued so all season. At harvest, 25 percent of fruit was injured in some orchards. The species has not developed as a problem in the south central fruit-growing section of Kansas. This pest reduced pear yields in Colorado and appeared in a few new orchards in Bernalillo and Sandoval Counties, New Mexico. Proper control methods were effective in New Mexico.

Some appearance records and other biological data on red-banded leaf roller were reported as follows: Delaware - Adults and egg masses first observed on April 10, with larval feeding becoming noticeable by mid-May. Mature larvae were present in mid-July and adults were observed in orchards July 20. Young second-generation larvae present in apples in early August. North Carolina - First adults of the season found in bait pails in Wilkes County on April 8. Wisconsin - Eggs numerous in many Door County orchards on May 15. Hatching of second brood observed July 25.

UNSPOTTED TENTIFORM LEAF MINER (Callisto geminatella) continued to appear over Illinois and caused severe damage to unprotected early apples and young plantings. Populations appeared in Doniphan County, Kansas, during May, and during September and October in south central Kansas. The pest was also present in apple orchards in Delaware, but disappeared in New Jersey.

FRUIT TREE LEAF ROLLERS were present in large numbers in some orchards in the Hudson Valley of New York although overwintering eggs were scarce, apparently migrating from nearby woodlands. FRUIT TREE LEAF ROLLER (Archips argyrospila) infestations were moderate to heavy and damaged apple foliage in Taos County, New Mexico. In Wisconsin, egg hatch was first observed May 15 in Door County, pupation on June 18 and adults emerged during first week of July. The overwintering eggs of a LEAF ROLLER (A. rosana) began hatching April 11 in the Willamette Valley of Oregon, about the same time as in 1958.

EYE-SPOTTED BUD MOTH (Spilonota ocellana) larvae were numerous in both old and young trees in many Door County, Wisconsin, orchards on May 15. Pupation was observed on June 12 and adults emerged on June 29. Overwintering larvae were feeding on cherry and apple leaves on July 19. This pest was one of the most important pests of cherries in Door County and its 1959 population was the highest in the past four years. Populations of BUD MOTHS in New Hampshire were very low.

ORIENTAL FRUIT MOTH (Grapholitha molesta) populations were higher than any year since 1948 on peaches in Ohio and gradually increased in Illinois. Some crops in the fruit-growing area of Lake Erie, Ohio, were not harvested because of the extensive larval infestation at harvest and partially sprayed orchards in Illinois were severely damaged. The third brood caused heavy twig damage to some young trees in Illinois. Low numbers of the pest were present in Indiana except for a few orchards in Knox County and twig damage was general throughout the peach-growing area of Kansas, with some "wormy" peaches evident in the south central area.

The occurrence of oriental fruit moth on peach varieties ripening after Alberta varieties was unusual in Connecticut. Populations were decreased from average levels in Rockland County, New York, and moderate damage occurred in late peaches in Maryland. In North Carolina, the first adults of the season were trapped in bait pails in Wilkes County on April 10. The pest was less abundant than usual in Georgia, but occurred in large numbers on pears in East Baton Rouge Parish, Louisiana.

The trapping program for oriental fruit moth in Oregon indicated the population to be somewhat more reduced. Of 131 properties trapped in that State, 150 specimens showed up only in the Salem area. The first adult was taken April 27. Populations in Washington were very low due to the cool spring, with practically no moths trapped. Only one report of fruit injury at harvest was reported in Washington.

PEACH TREE BORER (Sanninoidea exitiosa) continued heavy in many peach orchards in Georgia and examination of peach trees during September in Louisiana revealed heavy infestations. This pest is now considered the number one insect problem of peaches in Georgia. Damage in Kansas was less severe in the Arkansas River Valley than in previous years but increased in the northeast area around Wathena, Doniphan County. Damage to stone fruits was general in Utah and light in Ohio, Oklahoma and Texas.

WESTERN PEACH TREE BORER (Sanninoidea exitiosa graefi) caused general damage to stone fruit orchards in Utah and a PEACH TREE BORER (Sanninoidea sp.) caused light to heavy losses to peach orchards in New Mexico.

LESSER PEACH TREE BORER (Synanthedon pictipes) was heavy in some peach orchards in Georgia, but the general infestation appeared to be somewhat less than in recent years. This may have been due to less winter tree injury during 1959. More reports of damage by this pest were received than usual in New Jersey and infestations were observed in all commercial peach orchards in Ohio, being severe at several localities. Adult emergence in Lincoln Parish, Louisiana, was approximately three-fourths complete by mid-May and heavy infestations were observed in trees in September. Infestations in eastern Texas were generally light.

Infestations of PEACH TWIG BORER (Anarsia lineatella) were somewhat heavier than previous years in Texas and caused losses to peaches in Colorado. In New Mexico, this species killed the majority of trees in a 2-year-old peach, plum and cherry orchard near Alamogordo and was a problem in many peach orchards, generally. Above average damage to fruits and twigs was quite general in Utah and a greater amount of injury to peach, prune and plum than for several years was recorded in Oregon, with poorly treated orchards having as much as 20 to 50 percent loss of fruit. In Washington, damage to stone fruits was moderate, being a greater problem than usual in Chelan County during May. In early June, this species was abundant and hard to control in Washington. For several years orchardists in this State have had to apply more, and use better timing of, treatments to get satisfactory control.

TOMATO FRUITWORM (*Heliothis zea*) caused slight damage to small peach fruits in northeast Arkansas and infested peaches were numerous at Wichita, Kansas, on July 25. GREEN FRUITWORM (*Lithophane antennata*) decreased from average levels in Rockland County, New York.

FALL CANKERWORM (*Alsophila pometaria*) and SPRING CANKERWORM (*Paleacrita vernata*) decreased from average levels in Rockland County, New York, during 1959, and AMERICAN PLUM BORER (*Euzophera semifuneralis*) was recorded from Ohio for the first time at Doylestown where it caused minor injury to peach trees. This species also damaged fruit and nut trees in Washington County and pecan trees at Toquerville, Utah. FALL WEBWORM (*Hyphantria cunea*) was the heaviest in years on apple, pear and cherry trees in the Willamette Valley of Oregon.

PLUM CURCULIO (*Conotrachelus nenuphar*) infestations were a problem in several areas of the country during 1959. In the New England States, populations were unusually high in Massachusetts, caused moderate damage on inadequately protected fruit in Rhode Island, as well as moderate to severe damage to apples in the Springvale area and moderate damage locally in the Sanford area of Maine. A slight increase was noted in Dutchess County, New York, and a normal amount of damage was reported in New Jersey. Injury was severe only in untreated trees in Delaware and local damage was reported in Virginia.

Infestations of plum curculio in Georgia were not generally heavy in 1959, although some individual peach orchards were heavily infested; one Fort Valley orchard had 43 percent of drops infested. Except for 1958 and 1950, this was the heaviest drop infestation since 1947. Enforcement of controls showed very good results throughout the season in most cases. The hibernating adult population in the peach belt of Georgia during the winter of 1959-60 is heavier than for an average year.

Plum curculio infestations in other areas were reported as follows: Normal in Kansas and Illinois, generally low in Minnesota, present in west central and south central South Dakota on untreated plums, light in Texas, and generally not severe on apples in Ohio though the insect was more abundant on peaches in 1959 than in 1958. Adults of this species began laying eggs in Door County, Wisconsin, about June 6 and continued until late May. This species became important in cherry orchards in Wisconsin. Adults were numerous on native plums in Clairborne and Webster Parishes, Louisiana, during April, and were first jarred from peach trees on April 10 in Delaware. The severe winter temperatures at Wooster, Ohio, (reaching -14°F.) had little effect on this pest.

CURCULIONIDS decreased from average levels due to better controls in Connecticut and the high temperatures of 10 days' duration that followed calyx stage in New Hampshire were ideal for activity of these pests. Growers in this State who did not get sprays on at the beginning and during this period suffered considerable injury to their fruit.

PLUM GOUGER (*Anthonomus scutellaris*) larvae and pupae were collected from wild plums at Rinconado, Rio Arriba County, New Mexico. Reared adults were determined as this species, a new record for the State.

SHOT-HOLE BORER (*Scolytus rugulosus*) was evident in devitalized, weak or diseased trees in neglected orchards in Georgia, caused average, local damage in Utah and was a problem on apricot, peach and plum trees in New Mexico.

Several SCARABAEIDS were reported as pests of fruit trees in 1959. *Macrodactylus uniformis* was heavy in the tops of trees in late July in Arizona and did considerable damage before being controlled. *Cotinus texana* was a serious problem on peach trees in New Mexico. Adults of *Pleocoma minor* began emerging in two irrigated apple orchards near Hood River in Washington by September 15.

A FLEA BEETLE (Altica foliacea) caused considerable damage to apple foliage in orchards in Dona Ana, Valencia and Lincoln Counties, New Mexico, during May and defoliated a grape vineyard in Dona Ana County. WESTERN SPOTTED CUCUMBER BEETLE (Diabrotica undecimpunctata) caused some injury to ripened peaches in Oregon.

PACIFIC FLATHEADED BORER (Chrysobothris mali) became a more severe problem than normal in many parts of Oregon, especially in the fruit-growing sections of the central Willamette Valley, Umatilla and Klamath Counties.

CALIFORNIA PRIONUS (Prionus californicus) larvae occasionally damaged fruit tree roots in Utah and larvae were taken from living cherry tree at Clarkston, Asotin County, Washington, in January.

Several APHIDS were important pests of fruit trees during 1959. Of those species reported, apple aphid appeared to be the most widespread and damaging. Aphid infestations in Utah were generally above normal and the unusual late outbreak in Connecticut caused some black smudging of fruit. However, the predator activity on early-season aphids was probably greater than normal in Connecticut.

APPLE APHID (Aphis pomi) infestations were heavy during various periods of the spring and summer in the Eastern States. Populations in Maine were heavy and damage was severe at numerous locations during July, and they were more serious than for several years in New Hampshire, especially in trees that were headed back and where there was new sucker growth. Populations in Massachusetts and Rhode Island were unusually high and the period of activity and migration of winged forms longer than usual. The rainy weather and high temperatures provided favorable conditions for the pest in these areas. In New Hampshire, it was reported that this was one year that controls would have been worthwhile on apples. In New Jersey, infestations caused a normal amount of damage and they were heavy on new terminals in Delaware by late May and on fruit in early June.

In the Central States, apple aphid conditions were as follows: Severe on some plantings of nursery stock in Ohio and damaging, but not severe, in most orchards; abundant in late March and late May in Indiana, with several infestations in Vincennes area needing control; and serious on apples in Door County, Wisconsin. Wet, cool weather was responsible for conditions in Indiana.

In the Western States, apple aphid affected yields of apples in Colorado, damaged apples in many localities of Utah, became abundant in many neglected orchards in southwestern Idaho during early April, built up during the spring in Washington and was especially abundant in nurseries and on ornamental crab apple in Oregon. Eggs of apple aphid hatched during March in the Wenatchee area and during mid-April at Pullman, Washington. The buildup in Washington declined in midsummer, however, and remained low for the remainder of the season. In Idaho, populations were drastically reduced by late May, probably as a result of predator and parasite activity.

ROSY APPLE APHID (Anuraphis roseus) was more of a problem in the Western States than in the East. The species was particularly abundant and severe throughout Utah; moderately heavy in several apple orchards in San Juan and Taos Counties, New Mexico; present in greater-than-normal abundance on apples in Oregon; and caused localized outbreaks during the early season in Washington. The records of damage in Washington were practically the first in the eastern area of that State in 12 years. This pest was also recorded at Riverton, Wyoming, but no damage was observed.

In the East, very little, if any, rosy apple aphid damage was observed in Ohio, Indiana, Virginia and Delaware. A high overwintering egg population and good hatch were recorded in Illinois, but the threat was largely handled by predators and treatments. The first nymphs were present in late March in Delaware.

APPLE GRAIN APHID (Rhopalosiphum fitchii) was generally light in Delaware, Minnesota and Wisconsin. Nymphs first appeared in March in Delaware and were general during early June in Door County, Wisconsin. By July 3, however, populations were heavy in most orchards in Wisconsin, but decreased by July 25 except on young, actively growing terminals.

GREEN PEACH APHID (Myzus persicae) was a problem in orchards in several western states. Heavy infestations were reported throughout New Mexico during the spring and early summer on peaches. The pest was general on fruit trees in Nevada, more abundant than usual on peaches by early June in Washington (the most severe in 12 years in the Wenatchee area), and by early May was general on peach and apricot trees in the upper Snake River Valley of Idaho, with populations being higher than those of 1957 and 1958 in that State. Fairly heavy infestations were also recorded in Canyon County, Idaho. Eggs began hatching in eastern Idaho about April 1 and stem mothers were producing young by early May. By late June, movement of spring migrants in the upper Snake River Valley was nearly complete. In Washington, some controls failed in many orchards in the central area during May.

BLACK CHERRY APHID (Myzus cerasi) was more widespread than normal in Oregon and much more severe infestations occurred than in 1958. Populations began decreasing rapidly in mid-July, however, due to heavy parasitism on untreated trees and by chemical controls where they were practiced. In Idaho, severe infestations developed in neglected orchards in the southwestern area during May and moderate infestations continued into late June because of cool weather in the Wenatchee area of Washington. The species was reported as a general pest of fruit in Nevada.

BLACK PEACH APHID (Anuraphis persicae-niger) was heavy and damaged peach trees at Rinconado, Rio Arriba County, New Mexico.

WOOLLY APPLE APHID (Eriosoma lanigerum) was damaging in several states during the year. Infestations were more abundant than usual in apple orchards in Oregon, low in the Yakima area of Washington but greater than normal in the fall, damaging in many localities of Utah, affected yields of apples in Colorado and medium on apples in central Arizona during spring and summer. The aphid was a general pest in fruit trees in Nevada, very common in apple orchards during spring and early summer in New Mexico and heavy in some apple orchards in central and east central Oklahoma from June to August. Reports of the pest in North Carolina were confined to the mountains. WOOLLY PEAR APHID (E. pyricola) was usually only a pest in nurseries in Oregon, but was noted damaging a commercial pear orchard near Independence.

MEALY PLUM APHID (Hyalopterus arundinis) infestations were heavy on plums in the Yakima area of Washington by July, but light on plums generally throughout Ohio.

A LEAF-CURL APHID (Anuraphis helichrysi) caused damage in many localities of Utah and was abundant on prune trees in the Willamette Valley of Oregon, an unusual occurrence in that State. The species was also general in fruit trees in Nevada.

PEAR PSYLLA (Psylla pyricola) was light to moderate on apples in the Monmouth area of Maine, with damage being light up to May 30, and light to moderate damage was reported in the Leeds area in June. This pest was also troublesome in home plantings during early August in Providence County, Rhode Island. Populations in Oregon were greater than normal in the Willamette Valley and required control through July, while in Washington the first-generation adults reached a peak during early June, with infestations becoming serious in many central area orchards. Resistance to certain chlorinated hydrocarbons was first noted in 1958 in Washington and became widespread in both Wenatchee and the Yakima areas. By the second cover, most growers in Washington applied new insecticides and little late season damage occurred. The first brood of pear psylla hatched March 30 at Medford, Oregon, much later than in 1957 or 1958, and the first eggs were found March 13 at Wenatchee, Washington. The first newly hatched nymphs at Hood River, Oregon, were detected on April 10 and the first generation was in the first and second instar by late April at Wenatchee, Washington.

PERIODICAL CICADA (Magicicada septendecim) was present in the southern two-thirds of Illinois and was very abundant in some localities. Some severe damage was reported in Johnson County and from Calhoun County northward to Nauvoo. Emergence began in early to mid-May in Missouri. The populations were heavier in central, east central and south central Missouri and egg laying began the latter part of May.

APPLE MEALYBUG (Phenacoccus aceris) was heavy on apples in the Wilton area of Maine in May and June, but low in the South Bridgeton area in July. Infestations in the Wilton area were under control in July, however. This species was found in Bennington County, Vermont, a new record for the State. GRAPE MEALYBUG (Pseudococcus maritimus) was found infesting pear trees in Jackson County, Oregon, the first report of such damage in this area, and infestation of pears occurred for the first time in several years in the Wenatchee area of Washington.

SAN JOSE SCALE (Aspidiotus perniciosus) was a problem, locally, in several states. The general infestatin was less than that of 1958 in Georgia and heavy infestations were reported during September in Louisiana. States reporting occasional damaging infestations, usually in untreated orchards, were Washington, Oregon, Utah, New Mexico, Oklahoma, Ohio, Maryland, New York and New Hampshire. The first crawlers were observed June 19 in Washington and crawlers were still active near Corvallis, Oregon, in mid-October.

Several other SCALE INSECTS were recorded as pests in 1959, including Chionaspis sp. on apple in Randolph County, North Carolina; white peach scale (Pseudaulacaspis pentagona) on peach in Houston County, Georgia; European fruit lecanium (Lecanium corni) on peach in the Clyde area of Ohio; and Forbes scale (Aspidiotus forbesi) in Sandoval County, New Mexico, and throughout Indiana.

LEAFHOPPERS varied from numerous to abundant on apple, plum and prune in Utah and were a problem in many areas of New Mexico on backyard fruit trees. BOXELDER BUG (Leptocoris trivittatus) caused normal amount of damage to ripe fruit in northern and central Utah.

Several CATFACING INSECTS were important during the year. In Georgia, deformed and gnarled peaches were more abundant than usual, especially in Dooly County, and above normal damage was noted in Utah. TARNISHED PLANT BUG (Lygus lineolaris) caused considerable damage to peaches in Maine, much heavier than in previous years, and injury to apples was much above that of 1958 in the southern part of the State. Tarnished plant bug populations were also very high on peaches during bloom in Illinois and this species and stink bugs were plentiful on south central Kansas peaches. Catfacing insects on peaches were below normal in Ohio except for GREEN STINK BUG (Acrosternum hilare). Other states reporting damage by catfacing insects were Texas, Colorado, Illinois and Virginia.

LEAF-FOOTED BUG (Leptoglossus phyllopus) caused considerable damage to plums in East Baton Rouge Parish, Louisiana.

APPLE MAGGOT (Rhagoletis pomonella) was a major problem during the year, particularly during the latter part of the season in New England and other areas. The infestations of this species were severe and caused heavy fruit injury by mid-September in Maine, were unusually numerous during the last half of the season in New Hampshire, continued a problem in September and October in Massachusetts and were especially severe in home plantings in Rhode Island. In these New England states, weather conditions appeared to be a major factor regarding lack of good control in that area. Apple maggot was also serious in several other eastern states. Severe infestations of apples were also recorded in Washington County, Maryland, and on many orchards where late sprays were omitted in Pennsylvania. The species was considered more serious than usual in New Jersey.

In the Central States, reports of injury by apple maggot were noted in several states. In Wisconsin, the pest continued to be one of the major apple pests and infestations were heavy on untreated apples throughout the State. Populations were also extremely high in neglected orchards in Minnesota and considerable damage was recorded in east central and southeast South Dakota, where up to 100 percent of the fruit was infested. Good control of Minnesota infestations was achieved only in commercial orchards where treatments were applied through the end of August. Numerous reports of injury from home growers in Ohio were recorded, with some injury in several commercial plantings of apples noted. Several plantings of Italian plums were also infested in Ohio.

Some biological data on apple maggot for 1959 as submitted by the states were as follows: Maine - Emergence began July 13 in cages at Highmoor and peak emergence appeared to take place July 31. Bait trap captures indicated that emergence slowed down sooner than in past years and activity was generally terminated much earlier than in the past. The trap captures in September were well below those of 1958. Indiana - Emergence was prolonged. Wisconsin - First adults trapped at Madison on July 2. Emergence occurred during first week of July in Door County and egg laying continued into August.

MAGGOTS of undetermined species were unusually heavy in fruit orchards in Connecticut, with flies being present as late as the first week of October, and the greatest activity in August.

WESTERN CHERRY FRUIT FLY (Rhagoletis cingulata indifferens) was recorded for the first time in Wenatchee, Washington, area proper on June 20 and infestations were at approximately the same levels as in 1958 in Idaho. The adult emergence data for 1959 were reported as follows: Oregon - Emerged May 28 at The Dalles, May 29 at Hood River, June 6 in Willamette Valley and June 1 in Medford area. Washington - First adult trapped in Yakima Valley, May 23. The latest emergence in 11 seasons because of cool weather. Idaho - First adults taken from sticky-board traps at Weiser on May 19.

In Florida, a FRUIT FLY (Anastrepha nigrifascia) was collected in a McPhail trap at Key West, Florida, on June 6 (apparently the first record since 1936 in the State) and PAPAYA FRUIT FLY (Toxotrypana curvicauda) was common during the spring months wherever papayas are grown, with about 60 percent of dooryard plantings being infested in Palm Beach County during May.

EUROPEAN APPLE SAWFLY (Hoplocampa testudinea) was recorded for the first time in Rhode Island. Nearly mature larvae were collected in small apple fruit from the Hopkinton area on June 3 and from the Kingston and North Scituate areas during the next two weeks. The species did not reach pest proportions in any commercial orchards. Undetermined SAWFLIES decreased from average levels in Connecticut due to better controls. GIANT HORNET (Vespa crabro germana) was reported feeding on apple fruit during early September in Yancey County, North Carolina.

PEAR-SLUG (Caliroa cerasi) damaged fruit trees in several states. In Oregon, this species was abundant on cherries, prunes and pears in Benton County by mid-October. Populations of the pest were about normal in Nevada and lower than 1958 in Wyoming, although cherry trees were damaged throughout the State in 1959. Infestations of pear-slug in Utah were moderate on cherry, pear and plum foliage, caused considerable damage to plum foliage in Rio Arriba and Taos Counties, New Mexico. This species also defoliated many cherry trees in Lake County, South Dakota. In the East, this species was found early in June in Delaware, feeding on pears and cherries, and the second-generation larvae caused severe damage to pear and cherry trees in the Pawtucket and North Providence areas of Rhode Island during late August. CALIFORNIA PEAR-SLUG (Pristiphora californica) reached noticeable numbers on pears in the Medford area of Oregon during mid-April.

GALL MIDGES again produced galls which ruined chokecherry fruits in several areas of Utah and two other MIDGES were reported causing damage in Oregon and Maine. In Oregon, Dasyneura pyri appeared in greater numbers than for several years in scattered districts of the Willamette Valley, and D. mali was generally moderate to heavy in orchards throughout Maine.

PEAR THRIPS (Taeniothrips inconsequens) was common in cherry, apple and pear orchards during the spring in Utah and a peak emergence of this species occurred the week ending March 28 in Oregon, approximately the same date as 1958. Populations in Oregon were low and below economic levels. RED-BANDED THRIPS (Selenothrips rubrocinctus) was more abundant than in 4 or 6 years on mango at Goulds in Dade County, Florida, on November 20. About one percent of the nursery stock was losing leaves.

Several pests of currants were reported in Utah. CURRANT APHID (Capitophorus ribis) caused above normal injury to red currant foliage. CURRANT FRUIT FLY (Epochra canadensis) infestations in black and yellow currants were general and a CURRANT PSYLLID was common but rarely severe.

EUROPEAN RED MITE (Panonychus ulmi) was a serious pest of orchards in several states during the year. Those states that reported the heaviest damage during the season were Delaware, Maryland, New Jersey, Ohio, Illinois, Kansas and Oregon.

In the Atlantic States, outbreaks of this species occurred in Delaware, Maryland and New Jersey, and an increase was noted in the Hudson Valley of New York. Infestations in Maine were generally light, with a rapid increase noted in July, a recovery from the wet weather of June. The outbreak that occurred in Delaware and Maryland was favored by the dry, hot weather after mid-June. Infestations on apples in Georgia were light, but could have been serious except for excellent control practices.

In the Central States, European red mite was rated as the number one pest of apples in Ohio and caused considerable damage on apples and some on peaches in Illinois. Infestations in Indiana were dominant until late June. Counts in Wisconsin averaged 14 per leaf on July 7 and reached a peak of 42 per leaf by the middle of July on untreated trees. Severe infestations arose early in the season in Ohio and were controlled only with difficulty. The species was moderately abundant in most peach orchards in this State and reached pest proportions in a number of orchards. In Kansas, heavy populations of this pest occurred on apple foliage in the northeastern area during July and August.

In the Western States, infestations of European red mite were about normal in Utah, but caused severe damage to poorly treated fruit trees in the Willamette Valley of Oregon during mid-October. In Washington, light to heavy populations occurred on stone fruits near Wenatchee by August, but were about normal on apples and pears in the central area. Eggs and recently hatched nymphs were abundant in southwestern Idaho during early April and populations during July were severe, but spotted, on fruit trees in the Idaho Falls area.

Some biological notes on European red mite during the 1959 season were as follows: Delaware - Nymphs numerous on apple leaves by April 21. North Carolina - Eggs were hatching on apple on April 6 in Wilkes County and had completed one generation by beginning of petal fall. Illinois - Overwintering egg populations extremely variable, as usual. Wisconsin - Present in both larval and nymphal stages in Door County on May 22. By June 12, the first summer-generation eggs were hatching. Oregon - Began hatching from overwintering eggs April 17 in Hood River Valley and on April 15 in Medford area. Idaho - Eggs hatched by early April in southwestern area. By late May, populations that were heavy in early April had dropped, apparently as a result of predacious mite activity.

TWO-SPOTTED SPIDER MITE (Tetranychus telarius) was an important pest of orchards in several states. In the Eastern States, infestations were reported as being important in Pennsylvania, considerably above normal and causing extensive damage in Maryland, causing above normal damage in New Jersey, resulting in an outbreak on apple and peach trees in northeastern Connecticut during late May, increased somewhat in the Hudson Valley of New York and were less numerous than usual in Massachusetts and Vermont. Infestations on apples in Georgia were generally light, but could have developed into a serious problem if controls had not been adequate.

Infestations of this species in the central areas of the country were reported as being serious on peaches and apples from the first week of July on in Indiana, but infestations in Ohio and Illinois were generally not serious. Populations were moderately abundant in peach orchards in Ohio, however. In Kansas, heavy populations developed during July and August in the northeastern area on apple foliage.

Infestations of two-spotted spider mite in the Western States were reported as being light to heavy on stone fruits in the Wenatchee area of Washington by August, heavier than usual on pears in the Medford area of Oregon and affected the yield of apples, pears and peaches in Colorado. The pest was observed going into hibernation by October 13 in Medford area of Oregon.

FOUR-SPOTTED SPIDER MITE (Tetranychus canadensis) appeared early on fruit trees and in litter in Illinois and was destructive over most of the State. The species also infested many orchards in Utah. Another SPIDER MITE (T. mcdanieli) appeared earlier than usual and in greater numbers in Washington, especially on apples in the north central area. Egg laying by this species was heavy during late spring and severe injury to apples occurred by August, possibly the worst in 10 or 12 years. T. mcdanieli was about normal in the Yakima Valley of Washington on pears and stone fruits, but populations of this species appeared to show some resistance and were a serious problem in the central area. T. mcdanieli was also highly injurious in many apple and sour cherry orchards in Weber and Box Elder Counties, Utah, and caused light to severe damage to red currants in a number of counties in that State.

YELLOW SPIDER MITE (Eotetranychus carpini borealis) was found in the Springvale and Monmouth areas of Maine in May. One heavy infestation was found in the Leeds area in June, but damage was negligible.

A FRUIT TREE MITE (Bryobia rubrioculus) was the most serious pest in untreated apple and peach orchards during the early summer in New Mexico, with heavy infestations severely damaging foliage of host trees throughout the fruit-growing areas of that State where improper controls were used. In Oregon, this species was noticeably abundant on sweet cherries in the Willamette Valley late in the season and after fruit harvest. The pest did cause losses to peaches in Colorado, but numbers were below average in Utah and it was not a serious orchard pest in Washington.

PEAR LEAF BLISTER MITE (Eriophyes pyri) was severe on pear in South Kingston and Warwick, Rhode Island, during late May and continued to be a pest of Baldwin apples in some orchards in New Hampshire, especially in the northern apple areas of the State. The species reduced the pear yield in Colorado and was at least normally damaging in Utah, particularly in Weber and Utah Counties. In Oregon, this species had not moved from blisters on green pear leaves as of October 20 in the Medford area.

PEACH SILVER MITE (Vasates cornutus) caused losses to peaches in Colorado and was about average in Utah. APPLE RUST MITE (V. schlechtendali) was not a problem in Washington during 1959, but V. fockeui was moderate to heavy on cherries in the Wenatchee area by August and was moderate on prunes in the lower Yakima Valley.

ORCHARD MITES of undetermined species were also reported as pests of fruit trees in several states. Several species were commonly severe in apple and pear orchards and moderately severe on raspberry and red currant crops in Utah; generally light in Minnesota; unusually heavy in late July and early August in Rhode Island; high in Indiana; were favored by the hot, dry weather in the Hudson Valley of New York; and were not considered a problem in Virginia. SPIDER MITES (*Tetranychus* spp.) appeared three weeks later than 1958 in Utah and severely damaged several orchards in Lincoln, Bernalillo and Sandoval Counties, New Mexico; however, infestations in New Mexico were not as serious as in 1957 and 1958. The infestations of *Tetranychus* spp. in Nevada were more numerous than in 1958 and were reported from more areas than in previous years. In Delaware, *Tetranychus* spp. were noted on apple trees in mid-July, but never in the proportions of European red mite, and in North Carolina these mites were unusually severe in many plantings in the southeastern counties because heavy rains prevented treatments.

Nut Tree Insects: WALNUT CATERPILLAR (*Datana integerrima*) damage was lighter than 1958 in Oklahoma and very light during 1959 in Texas when compared with severe infestations of 1958 that occurred in that State. In Louisiana, this species caused some damage to pecan in the greater New Orleans and Baton Rouge areas.

FALL WEBWORM (*Hyphantria cunea*) infestations were light to moderate on pecans in Georgia, being less important than in previous years. Larvae first appeared on pecans in Louisiana during late May in most of the State and by September infestations were general. In Oregon, the pest was noticeable on walnut trees in the northern Willamette Valley, with 8 to 10 webs per tree common in untreated orchards. Adults began emergence in the Salem area of Oregon on May 6.

PECAN NUT CASEBEARER (*Acrobasis caryae*) caused heavy losses to the pecan crop in Texas and the damage was heaviest in south central Oklahoma during the year. Damage gradually decreased in central and north central Oklahoma and a few localized areas in other sections of the State reported medium to heavy infestations during the late spring. In Florida, larvae damaged new growth of pecan grafts and both larvae and pupae were found in twigs on bearing pecans on April 13. Damage to twigs was unusually heavy in Florida and was estimated at 25 to 50 percent on some varieties of pecans. The first moths emerged on May 1 in this State. The species also caused losses in Martin County, North Carolina, in August.

PECAN LEAF CASEBEARER (*Acrobasis juglandis*) was widespread on pecan in the northern Coastal Plain of North Carolina in early May and was reported feeding on new growth of pecan in April in Florida, where the pest was also reported to have heavily damaged Mahan pecans during May. Larvae of another casebearer, *A. caryivorella*, also damaged new growth of pecan buds and grafts in a commercial nursery in Florida. Pecan leaf casebearer and PECAN CIGAR CASEBEARER (*Coleophora caryaefoliella*) were both heavy on pecans in some southern areas of Georgia. Some pecan trees in Ware County were 60 to 90 percent defoliated.

HICKORY SHUCKWORM (*Laspeyresia caryana*) was common in most pecan groves in Oklahoma throughout the late summer and early fall, was heavy on pecan in Franklin Parish, Louisiana, and caused heavy losses of pecans in Texas and Georgia.

Larvae of a NOCTUID (*Catocala palaeogama*) caused considerable damage to shoots and small nut clusters of pecan in one locality in the south central area of Oklahoma during June. NAVEL ORANGEWORM (*Paramyelois transitella*) reported for the first time from Utah on almonds in Washington County. FILBERTWORM (*Melissopus latiferreanus*) emerged July 2 in the Willamette Valley of Oregon. Abundance was somewhat less than in 1958 in this State.

PECAN WEEVIL (Curculio caryae) infestations were light on pecans in Georgia, but caused losses in Martin County, North Carolina, during August. MAY BEETLES (Phyllophaga spp.) were heavy on pecan trees in some central Georgia areas.

WALNUT HUSK FLY (Rhagoletis completa) has spread in Utah and was generally damaging throughout Weber and Davis Counties, as well as infesting additional walnut-growing locations in the Provo and Salt Lake City areas. Larvae of this species were found in English walnut at Prosser, Washington, on October 2; the only previous distribution record was at Yakima, being first recorded there in 1954. The trapping program for this pest in Oregon was negative.

PECAN PHYLLOXERA (Phylloxera devastatrix) nymphs began migrating to unfolding buds of pecan in late March in Louisiana, and a SPITTLEBUG (Clastoptera achatina) was light to moderate on pecans in the Monticello area of Florida.

BLACK PECAN APHID (Melanocallis caryaefoliae) and BLACK-MARGINED APHID (Monellia costalis) infestations were light to moderately heavy and damaged pecan trees in Dona Ana, Chaves and Eddy Counties, New Mexico, and black-margined aphid heavily infested pecans in Clark County, Nevada. APHIDS of undetermined species were reported severely infesting pecan in Washington County, Utah, and black walnuts in Utah, Salt Lake, Weber, Davis and Box Elder Counties, Utah. Aphid numbers were moderate elsewhere in Utah on nut trees, being usually light on English walnut foliage in Weber, Davis, Utah, Washington and Grand Counties. Monellia sp. was common in most pecan groves throughout Oklahoma during the late summer and early fall. A FILBERT APHID (Myzocallis coryli) was moderate, about general, on filbert foliage in Utah; and infestations in Yamhill County, Oregon, were heavier than in 1958 and in general heavier than all filbert-growing areas of the State. Some Oregon orchards showed nearly 100 percent of leaves infested.

WALNUT BLISTER MITE (Aceria erinea) heavily infested early walnuts near Dundee, Oregon, during the week of August 31.

Citrus Insects: A SCARAB (Phyllophaga elizoria) was found feeding on foliage of citrus nursery stock at Avon Park, Polk County, Florida, on April 1. This species is rare, but has been reported at least three times as a pest of citrus nursery stock in the Avon Park area. The last report was in 1950.

FLORIDA WAX SCALE(Ceroplastes floridensis) averaged 50 adults per leaf on citrus in Plaquemines Parish, Louisiana, and COTTONY-CUSHION SCALE (Icerya purchasi) was light and localized in Maricopa and Yuma Counties, Arizona. CITRICOLA SCALE (Coccus pseudomagnoliarum) was heavy in one citrus grove near Peoria in Maricopa County, Arizona, during April and May, and CITRUS WHITEFLY (Dialeurodes citri) was heavily infesting satsuma trees in Plaquemines Parish, Louisiana, during September.

In Arizona, CITRUS THRIPS (Scirtothrips citri) was heavy in citrus when in full bloom in late March and early April. The infestation was heavier than normal for that time of the year and continued heavy on through the spring in untreated groves or where treatments were unsuccessful. Considerable damage was caused to young fruit in some groves in both Yuma and Maricopa Counties. GRACILARIIDS (Mamara spp.) were medium in one grapefruit grove in Maricopa County.

CITRUS RED MITE (Panonychus citri) averaged 50 adults per leaf on citrus in Plaquemines Parish, Louisiana, and CITRUS FLAT MITE (Brevipalpus lewisi) was light to medium and a problem throughout the year in groves in Yuma County, Arizona.

Other Fruit Insects: AVOCADO RED MITE (*Oligonychus yothersi*) was much less abundant in avocado groves near Homestead, Florida, on December 31, 1958, than for over a decade. A CURCULIONID (*Heilipus squamosus*) was found under bark of avocado at St. Petersburg and Homestead, Florida, during the year.

GALL MIDGES (*Itonida* sp., *Lasioptera vitis*) were locally common in vineyards in South Kingston, Rhode Island, during early June. LEAFHOPPERS (*Erythroneura* spp.) increased on grape in late March in Arizona and were a problem throughout the spring. Fall infestations were very light. Undetermined LEAFHOPPERS have been a problem on grapes in New Mexico during the year.

WESTERN GRAPE LEAF SKELETONIZER (*Harrisina brillians*) became heavy on home yard grapes in Arizona during June, but were of little importance in commercial vineyards. In Utah, this species was again completely controlled by insect parasites and predators in Washington County. The pest was found for the first time in Nevada (in a one-acre vineyard in Clark County) during the year but additional surveys in adjacent areas were negative.

GRAPE BERRY MOTH (*Paralobesia viteana*) damaged grapes in a few Washington County, Utah, vineyards and backyard growers in Rhode Island were troubled by this pest.

GRAPE MEALYBUG (*Pseudococcus maritimus*) was found more widespread in grape-growing areas of the Yakima Valley in Washington than in any previous year. Many instances of partial failure of controls were reported. GRAPE SCALE (*Aspidiotus uvae*) infested 20 acres of grapes severely in McDowell County, North Carolina.

A BLUEBERRY THRIPS (*Frankliniella vaccinii*) was generally moderate on blueberries in most areas of Maine during May. Damage was moderate in Knox County and severe in Hancock County. In June, damage was moderate to heavy in the Knox-Lincoln County area and light to moderate in Washington County. In August, a light, late season infestation was found in a previously clean, new-burn field in the Jonesboro area of Maine.

BLUEBERRY MAGGOT (*Rhagoletis pomonella*) began to emerge June 30 at Jonesboro, Maine, reached peak flight on July 8 and 9 and ended on July 31. Only stragglers were recovered in cages in Maine from July 20 on.

BLACK-HEADED FIREWORM (*Rhopobota naevana*) damaged huckleberries in widely separated areas of western Washington. The adults were reared during the first half of July.

BLACK ARMY CUTWORM (*Actebia fennica*) infestations were found in many blueberry-producing areas of Maine during May. Severe damage was noted in the Knox-Lincoln County area and in the Cutler area of Washington County where it was estimated that 50 percent of the crop was damaged. This pest appeared to be increasing in several Maine localities. In June, infestations and injury were severe in the Cutler area, five growers being affected. Infestations were light in the Jonesboro area.

GARDEN SYMPHYLID (*Scutigerella immaculata*) caused severe damage to 40 acres of blueberries in Thurston County, Washington, during the early spring and also damaged this crop in the western area of the State during May and June.

CLIMBING CUTWORMS caused less than usual damage to fruits in Box Elder, Grand, Salt Lake and Weber Counties, Utah.

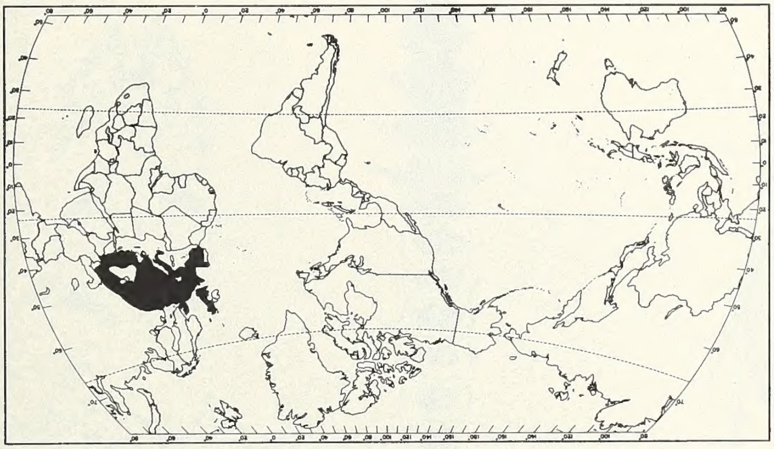
INSECTS NOT KNOWN TO OCCUR IN THE UNITED STATES

CORN GROUND BEETLE (Zabrus tenebrioides (Goeze))

Economic Importance: This carabid causes serious losses to small grains in several areas of Europe. During 1931-32, larvae infested more than 40 districts in the Ukraine (USSR) and completely destroyed or severely injured crops over areas of about 18 and 27 square miles. More recently (1947-52), in Vojvodina, Serbia and eastern Croatia, Yugoslavia, 18,251 acres of wheat, barley and rye were destroyed. Up to 109 larvae per square foot were recorded in samples taken in the infested areas. Upon emergence in the spring, adults cause additional damage by feeding on the small grains before the grains ripen.

Distribution: Recorded in Spain, France, England, Belgium, Holland, Denmark, Germany, Austria, Czechoslovakia, Poland, Hungary, Rumania, USSR, Italy, Yugoslavia, Bulgaria, Greece and Turkey.

Hosts: Small grains (wheat, barley, rye, oats) appear to be the most important cultivated crops. Has also been recorded on corn and beets, however.



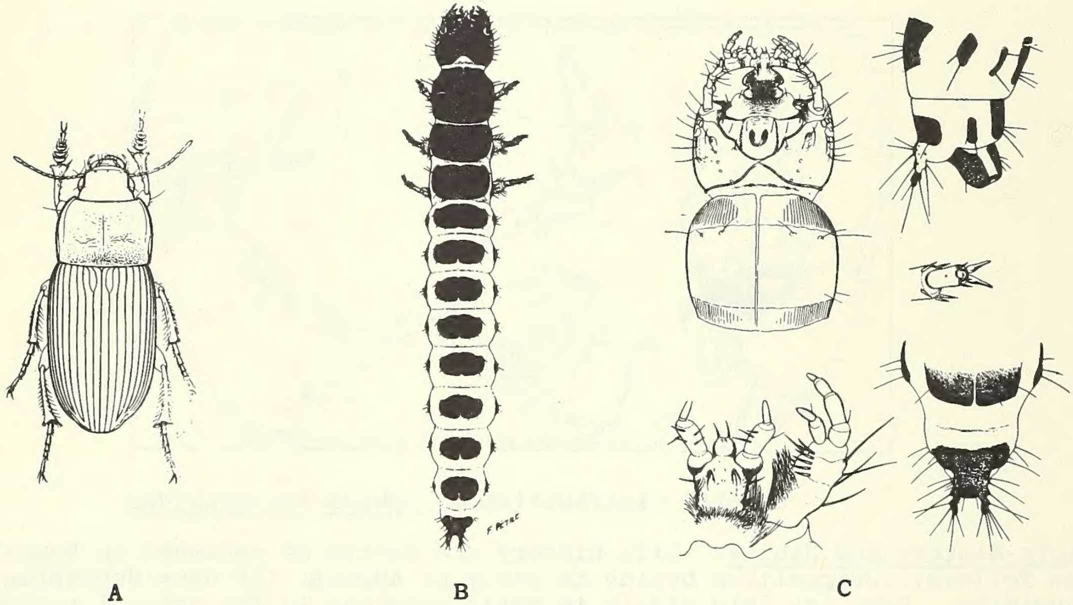
General Distribution of Zabrus tenebrioides

Life History and Habits: Life history and habits as recorded in Yugoslavia are as follows: Oviposition begins as early as August, the date depending on soil humidity. Eggs are laid singly in small chambers in the upper 7 inches of soil, averaging from 40-80 per female. The oviposition period is extended because eggs do not all mature at the same time. Larvae hatch in 8-17 days, or longer at temperatures below 60.8° F. Larvae may survive for 30-50 days without food. Larval feeding and development begin in late September and last for about 86 days in the laboratory, but up to 7 and one-half months in the field. Most larvae overwinter in first or second instar, ceasing to feed but continuing to molt. Pupation takes place in oval chambers in the soil in April or May and lasts for 12-20 days, depending on the temperature. On emergence, adults come to the surface and feed on wheat grains in "milky" stage until mid-June, when feeding ceases and they disperse to other grain fields. Maturation feeding then takes place, followed by an aestivation period lasting 1½-3 months. Pairing occurs during August and September. Although adults were reported to be nocturnal feeders in Yugoslavia, records from other countries indicate that they may feed on young

(Carabidae, Coleoptera)

plants during daylight hours. Spring-sown crops are also preferable to fall-sown crops. Infestations, though severe, are limited since the adults fly very little, if any.

Description: ADULT (from Fowler) - Convex, deep black, occasionally with a feeble metallic tinge; antennae and palpi ferruginous; thorax transverse, slightly narrowed in front, sides almost straight behind, posterior angles blunt right angles, base rather broader than extreme base of elytra, coarsely and strongly punctured in front and behind, disc much wrinkled; elytra broad, parallel, with strong punctured striae; femora black, tibiae and tarsi reddish. Length 14-16 mm. Mature LARVA reaches 30 mm., is narrow, elongated, flattened, distinctly segmented, yellowish-white color, except the head and the 3 segments of the thorax which are more leathery and chestnut color; abdomen is tapered to the extremity and ends in two appendages; each of its segments bears on its dorsum a reddish transverse leathery plate. Larva has stout mandibles and 3 pairs of well-developed legs terminated by a hard brownish hook. The small-size of the urogomphi on the ninth abdominal segment is characteristic of the genus Zabrus. (see illustration). These organs are almost one-half as long as the segment. They are chitinized and laterally bidentate. (Prepared in Survey and Detection Operations in cooperation with other ARS agencies). CEIR 10(10):3-4-60.



Figures of Zabrus tenebriodes : A - Adult. B - Larva. C - Details of Larval Head and Ninth Abdominal Segment.

Major references: Bjegovic, P. 1957. Inst. Plant Prot. Mem. No. 5, 104 pp., Belgrade. Fowler, W. F. 1887. The Coleoptera of the British Islands Vol. 1, pp. 58-59. Beffa, G. D. 1949. Gli Insetti Dannosi all'Agricoltura e i Moderni Metodi e Mezzi di Lotta. 978 pp., Milan. (pp. 493-495).

Figures (except map) and additional reference: Balachowsky, A. and Mesnil, L. 1935. Les Insectes Nuisibles aux Plantes Cultivees. Vol. 1, 1137 pp., Paris.

UNITED STATES DEPARTMENT OF AGRICULTURE
WASHINGTON 25, D. C.

Official Business

POSTAGE AND FEES PA
U. S. DEPARTMENT OF AGRICULT